Comparison of intraoral plaque formation on composite surfaces with different roughness: a scanning electron microscopy (SEM) study

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Abstract

Purpose: The purpose of the study was to observe and compare amount of plaque accumulated over time *in vivo* on composite with different surface roughness using scanning electron microscopy.

Methods: Composite tabs with three different categories of surface roughness were attached to retainers worn by the two investigators for a period of 1, 3, 5 and 9 days. Smooth tabs were created using mylar strip, medium roughness tabs were finished with green EP polishing discs, and rough tabs were finished with blue-coarse EP polishing discs. Care was taken to avoid brushing in the area of the retainer during the study period. After the study periods, tabs were removed, placed in fixer and then stored in buffer solution until the qualitative analysis with SEM.

Results: SEM images after one day of plaque accumulation showed greater plaque adhering to the rough surfaced composite than the smooth and medium roughness composite tabs. However, less distinction in plaque levels were seen in images after day three across different surface roughness categories. At nine days, differences in plaque accumulation could not be detected. It was also observed that plaque accumulation tended to follow along the surface finish tracks that result from polishing.

Conclusions: Composite surface roughness appears to be a more important factor with early plaque accumulation. With increasing time, plaque levels seemed to be similar irrespective of the composite surface roughness. The results also suggest that direction of polish may affect how plaque tracks along the composite surface and might be an important consideration.